

WRDS Industry Financial Ratio

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Overview

WRDS Industry Financial Ratio (WIFR hereafter) is a collection of most commonly used financial ratios by academic researchers. There are in total over 70 financial ratios grouped into the following seven categories: *Capitalization, Efficiency, Financial Soundness/Solvency, Liquidity, Profitability, Valuation* and *Others*. Ratios for each individual company as well as at industry aggregated level are included in the output.

Parameter Specification

Universe Selection:

Users can choose between the universe of CRSP Common Stock and S&P 500 Index Constituents. As many of the ratios studied here are void of economic meanings among the finance companies, we have hence excluded these firms from our universe.

Industry Classification:

Two systems of industry classification are accepted in the WIFR: GICS Economic Sector Level Index, and Fama-French Industry Classification. More specifically, the GICS classification includes 10 distinct economic sectors: Energy, Materials, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Financials, Information Technology, Telecom and Utilities. As Fama-French carries more than one unique industry classification system, we allow users to choose the exact number of industries.¹

Industry Level Aggregation:

Aggregation of financial ratios to industry level is an important consideration, especially when it comes to valuation ratios. As researchers have previously pointed out, P/E ratios (or generally ratios that use denominators that can be negative) should never be averaged.² While some industry practitioners advocate simply dropping out all the firms with non-positive ratios before aggregation, we propose keeping all the observations and taking the *median*, rather than mean, as

¹ Please see Kenneth R. French's website for detailed industry classification description.
http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

² See discussion on p 239 of Welch's "Intro to Finance",
<http://www.freeinfosociety.com/pdfs/misc/introtofinance.pdf>

the industry-level ratio.³ Users will still have access to all the firm-level ratio results, and if needed, can choose other aggregation metrics to arrive at the industry-level ratio.

Financial Ratio Definition

Theme Classification

WIFR collects over 70 different financial ratios, categorized based on the economic intuition into the following seven groups:

1. **Capitalization**: measures the debt component of a firm's total capital structure, e.g.: Capitalization Ratio, Total Debt-to-Invested Capital Ratio;
2. **Efficiency**: captures the effectiveness of firm's usage of assets and liability, e.g.: Asset Turnover, Inventory Turnover;
3. **Financial Soundness/Solvency**: captures the firm's ability to meet long-term obligations, e.g.: Total Debt to Equity Ratio, Interest Coverage Ratio;
4. **Liquidity**: measures a firm's ability to meet its short-term obligations, e.g.: Current Ratio, Quick Ratio;
5. **Profitability**: measures the ability of a firm to generate profit, e.g.: ROA, Gross Profit Margin;
6. **Valuation**: estimates the attractiveness of a firm's stock (overpriced or underpriced), e.g.: P/E ratio, Shiller's CAPE ratio;
7. **Others**: Miscellaneous ratios, e.g.: R&D-to-Sales, Labor Expenses-to-Sales.

Please refer to the **Appendix** section for complete list of financial ratios and corresponding categorization.

Individual Ratio

Individual financial ratios are samples of most commonly used metrics by academic researchers or industry practitioners.

Data Source:

All accounting related data are obtained from Compustat Quarterly and Annual file. Pricing related data, such as Market Capitalization and Price, are obtained from both CRSP and Compustat, and we rely on CRSP as the primary data source for pricing data. Earnings related data are from IBES database.

Data Frequency:

The final outputs for both individual firm and industry-level aggregated value are at monthly frequency. In order to populate the data to monthly frequency, we carry forward

³ We set default industry aggregation method to be *Median*, and yet provide users with the option of taking simple average across industry classification. Please use the *Mean* option with caution.

the most recent quarterly or annual data item, whichever is most recently available at a given time stamp, to the subsequent months before the next filing data becomes available.

In addition, in order to make sure that all data is publicly available at the monthly time stamp, we lag all observations by two months to avoid any look ahead bias.⁴

Outlier Control:

As ratio metrics often produce unintended extreme outliers, we impose two layers of outliers control before aggregating at the industry level. First, for all the monthly frequency firm level individual ratio results, we impose a winsorization at 1% level for extreme values, and truncate the outliers in the top and bottom percentile to be missing. Secondly, to arrive at the final ratio output, we enforce a 12 month moving average on the monthly frequency financial ratios. The second step serves two purpose: to further smooth the final output, and to fill in the truncated extreme months (from step 1) with firm-specific moving average.

Note that the outlier controls are **only** applied to the ratios fed to the industry-level aggregation. Outputs for firm-level financial ratios are *raw* ratios without any truncation or smoothing. Hence researchers are advised to censor/smooth the raw ratios to get rid of the extreme outliers before conducting further analysis.

Ratio Definition/Construction:

We provide definition to each individual ratio in the **Appendix** section. Please refer to the previous discussion on Data Frequency and Outlier Control for general guideline on data alignment and other technical treatment.

For the **underlying code** used to produce these ratios, please refer to the “Financial Ratio SAS Code” section listed under “Manuals and Overviews” page.

⁴ Although most recent filings carry only 45 days’ latency in the Compustat database, we set a two-month rule in order to make sure earlier filings are public information as of the monthly observation date.

Appendix: List of financial ratios and categorization

Financial Ratio	Variable Name	Category	Formula
Capitalization Ratio	capital_ratio	Capitalization	Total Long-term Debt as a fraction of the sum of Total Long-term Debt, Common/Ordinary Equity and Preferred Stock
Common Equity/Invested Capital	equity_invcap	Capitalization	Common Equity as a fraction of Invested Capital
Long-term Debt/Invested Capital	debt_invcap	Capitalization	Long-term Debt as a fraction of Invested Capital
Total Debt/Invested Capital	totdebt_invcap	Capitalization	Total Debt (Long-term and Current) as a fraction of Invested Capital
Asset Turnover	at_turn	Efficiency	Sales as a fraction of the average Total Assets based on the most recent two periods
Inventory Turnover	inv_turn	Efficiency	COGS as a fraction of the average Inventories based on the most recent two periods
Payables Turnover	pay_turn	Efficiency	COGS and change in Inventories as a fraction of the average of Accounts Payable based on the most recent two periods
Receivables Turnover	rect_turn	Efficiency	Sales as a fraction of the average of Accounts Receivables based on the most recent two periods
Sales/Stockholders Equity	sale_equity	Efficiency	Sales per dollar of total Stockholders' Equity
Sales/Invested Capital	sale_invcap	Efficiency	Sales per dollar of Invested Capital
Sales/Working Capital	sale_nwc	Efficiency	Sales per dollar of Working Capital, defined as difference between Current Assets and Current Liabilities
Inventory/Current Assets	inv_tact	Financial Soundness	Inventories as a fraction of Current Assets
Receivables/Current Assets	rect_act	Financial Soundness	Accounts Receivables as a fraction of Current Assets
Free Cash Flow/Operating Cash Flow	fcf_ocf	Financial Soundness	Free Cash Flow as a fraction of Operating Cash Flow, where Free Cash Flow is defined as the difference between Operating Cash Flow and Capital Expenditures
Operating CF/Current Liabilities	ocf_lct	Financial Soundness	Operating Cash Flow as a fraction of Current Liabilities
Cash Flow/Total Debt	cash_debt	Financial Soundness	Operating Cash Flow as a fraction of Total Debt
Cash Balance/Total Liabilities	cash_lt	Financial Soundness	Cash Balance as a fraction of Total Liabilities
Cash Flow Margin	cfm	Financial Soundness	Income before Extraordinary Items and Depreciation as a fraction of Sales
Short-Term Debt/Total Debt	short_debt	Financial Soundness	Short-term Debt as a fraction of Total Debt

Financial Ratio	Variable Name	Category	Formula
Profit Before Depreciation/Current Liabilities	profit_lct	Financial Soundness	Operating Income before D&A as a fraction of Current Liabilities
Current Liabilities/Total Liabilities	curr_debt	Financial Soundness	Current Liabilities as a fraction of Total Liabilities
Total Debt/EBITDA	debt_ebitda	Financial Soundness	Gross Debt as a fraction of EBITDA
Long-term Debt/Book Equity	dltt_be	Financial Soundness	Long-term Debt to Book Equity
Interest/Average Long-term Debt	int_debt	Financial Soundness	Interest as a fraction of average Long-term debt based on most recent two periods
Interest/Average Total Debt	int_totdebt	Financial Soundness	Interest as a fraction of average Total Debt based on most recent two periods
Long-term Debt/Total Liabilities	lt_debt	Financial Soundness	Long-term Debt as a fraction of Total Liabilities
Total Liabilities/Total Tangible Assets	lt_ppent	Financial Soundness	Total Liabilities to Total Tangible Assets
Cash Conversion Cycle (Days)	cash_conversion	Liquidity	Inventories per daily COGS plus Account Receivables per daily Sales minus Account Payables per daily COGS
Cash Ratio	cash_ratio	Liquidity	Cash and Short-term Investments as a fraction of Current Liabilities
Current Ratio	curr_ratio	Liquidity	Current Assets as a fraction of Current Liabilities
Quick Ratio (Acid Test)	quick_ratio	Liquidity	Quick Ratio: Current Assets net of Inventories as a fraction of Current Liabilities
Accruals/Average Assets	Accrual	Other	Accruals as a fraction of average Total Assets based on most recent two periods
Research and Development/Sales	RD_SALE	Other	R&D expenses as a fraction of Sales
Avertising Expenses/Sales	adv_sale	Other	Advertising Expenses as a fraction of Sales
Labor Expenses/Sales	staff_sale	Other	Labor Expenses as a fraction of Sales
Effective Tax Rate	efftax	Profitability	Income Tax as a fraction of Pretax Income
Gross Profit/Total Assets	GProf	Profitability	Gross Profitability as a fraction of Total Assets
After-tax Return on Average Common Equity	aftret_eq	Profitability	Net Income as a fraction of average of Common Equity based on most recent two periods
After-tax Return on Total Stockholders' Equity	aftret_equity	Profitability	Net Income as a fraction of average of Total Shareholders' Equity based on most recent two periods

Financial Ratio	Variable Name	Category	Formula
After-tax Return on Invested Capital	aftret_invcapx	Profitability	Net Income plus Interest Expenses as a fraction of Invested Capital
Gross Profit Margin	gpm	Profitability	Gross Profit as a fraction of Sales
Net Profit Margin	npm	Profitability	Net Income as a fraction of Sales
Operating Profit Margin After Depreciation	opmad	Profitability	Operating Income After Depreciation as a fraction of Sales
Operating Profit Margin Before Depreciation	opmbd	Profitability	Operating Income Before Depreciation as a fraction of Sales
Pre-tax Return on Total Earning Assets	pretret_earnat	Profitability	Operating Income After Depreciation as a fraction of average Total Earnings Assets (TEA) based on most recent two periods, where TEA is defined as the sum of Property Plant and Equipment and Current Assets
Pre-tax return on Net Operating Assets	pretret_noa	Profitability	Operating Income After Depreciation as a fraction of average Net Operating Assets (NOA) based on most recent two periods, where NOA is defined as the sum of Property Plant and Equipment and Current Assets minus Current Liabilities
Pre-tax Profit Margin	ptpm	Profitability	Pretax Income as a fraction of Sales
Return on Assets	roa	Profitability	Operating Income Before Depreciation as a fraction of average Total Assets based on most recent two periods
Return on Capital Employed	roce	Profitability	Earnings Before Interest and Taxes as a fraction of average Capital Employed based on most recent two periods, where Capital Employed is the sum of Debt in Long-term and Current Liabilities and Common/Ordinary Equity
Return on Equity	roe	Profitability	Net Income as a fraction of average Book Equity based on most recent two periods, where Book Equity is defined as the sum of Total Parent Stockholders' Equity and Deferred Taxes and Investment Tax Credit
Total Debt/Equity	de_ratio	Solvency	Total Liabilities to Shareholders' Equity (common and preferred)
Total Debt/Total Assets	debt_assets	Solvency	Total Debt as a fraction of Total Assets
Total Debt/Total Assets	debt_at	Solvency	Total Liabilities as a fraction of Total Assets
Total Debt/Capital	debt_capital	Solvency	Total Debt as a fraction of Total Capital, where Total Debt is defined as the sum of Accounts Payable and Total Debt in Current and Long-

Financial Ratio	Variable Name	Category	Formula
			term Liabilities, and Total Capital is defined as the sum of Total Debt and Total Equity (common and preferred)
After-tax Interest Coverage	intcov	Solvency	Multiple of After-tax Income to Interest and Related Expenses
Interest Coverage Ratio	intcov_ratio	Solvency	Multiple of Earnings Before Interest and Taxes to Interest and Related Expenses
Dividend Payout Ratio	dpr	Valuation	Dividends as a fraction of Income Before Extra. Items
Forward P/E to 1-year Growth (PEG) ratio	PEG_1yrforward	Valuation	Price-to-Earnings, excl. Extraordinary Items (diluted) to 1-Year EPS Growth rate
Forward P/E to Long-term Growth (PEG) ratio	PEG_ltgforward	Valuation	Price-to-Earnings, excl. Extraordinary Items (diluted) to Long-term EPS Growth rate
Trailing P/E to Growth (PEG) ratio	PEG_trailing	Valuation	Price-to-Earnings, excl. Extraordinary Items (diluted) to 3-Year past EPS Growth
Book/Market	bm	Valuation	Book Value of Equity as a fraction of Market Value of Equity
Shillers Cyclically Adjusted P/E Ratio	capei	Valuation	Multiple of Market Value of Equity to 5-year moving average of Net Income
Dividend Yield	divyield	Valuation	Indicated Dividend Rate as a fraction of Price
Enterprise Value Multiple	evm	Valuation	Multiple of Enterprise Value to EBITDA
Price/Cash flow	pcf	Valuation	Multiple of Market Value of Equity to Net Cash Flow from Operating Activities
P/E (Diluted, Excl. EI)	pe_exi	Valuation	Price-to-Earnings, excl. Extraordinary Items (diluted)
P/E (Diluted, Incl. EI)	pe_inc	Valuation	Price-to-Earnings, incl. Extraordinary Items (diluted)
Price/Operating Earnings (Basic, Excl. EI)	pe_op_basic	Valuation	Price to Operating EPS, excl. Extraordinary Items (Basic)
Price/Operating Earnings (Diluted, Excl. EI)	pe_op_dil	Valuation	Price to Operating EPS, excl. Extraordinary Items (Diluted)
Price/Sales	ps	Valuation	Multiple of Market Value of Equity to Sales
Price/Book	ptb	Valuation	Multiple of Market Value of Equity to Book Value of Equity